

Supplementary Information

Table S1. Average EDX table of element distribution in LSNF sample.

Z	Element	Family	Atomic Fraction (%)	Atomic Error (%)	Mass Fraction (%)	Mass Error (%)	Fit error (%)
8	O	K	41,99	3,8	11,38	0,67	0.10
26	Fe	K	11,87	1,84	10,8	1,57	0.10
28	Ni	K	12,21	2,08	12,84	1,87	0.03
38	Sr	L	16,96	2,62	24,51	3,5	0.01
57	La	L	17,11	2,43	40,47	4,98	0.14

Table S2. Specific surface area for samples obtained using USP method.

Sample	S_{BET} , $\text{m}^2 \text{g}^{-1}$
LSNF	6.9
LSCN	6.8
LSCF	6.9

Table S3. Texture coefficient for LSNF sample.

$(h\ k\ l)$	2θ	$d\ (\text{\AA})$	I/I_0	TC
(1 0 1)	24.25	3.6601	0.3816	0.9992(2)
(1 0 3)	31.56	2.8322	1	0.9987(1)
(1 1 0)	33.11	2.7038	0.8697	1.0023(2)
(2 0 0)	47.46	1.9119	0.5029	0.9996(3)

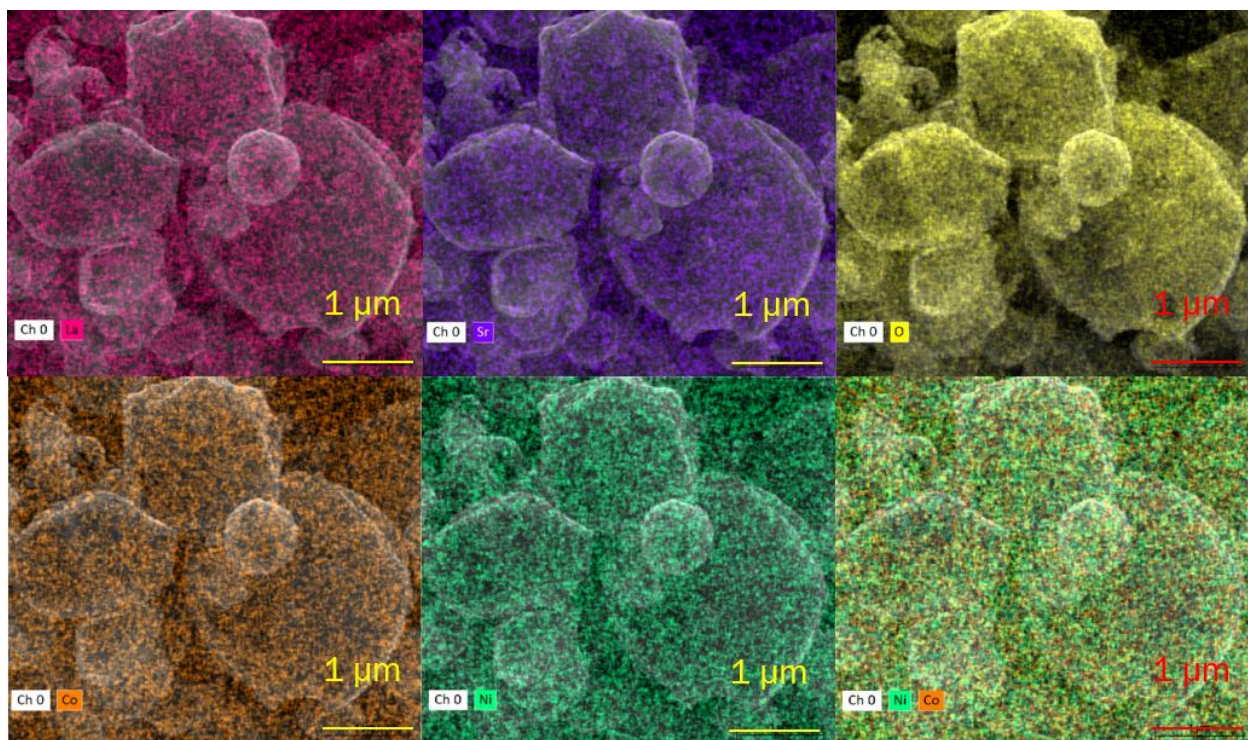


Figure S1. SEM-EDX elements distribution in LSCN sample obtained using USP method.

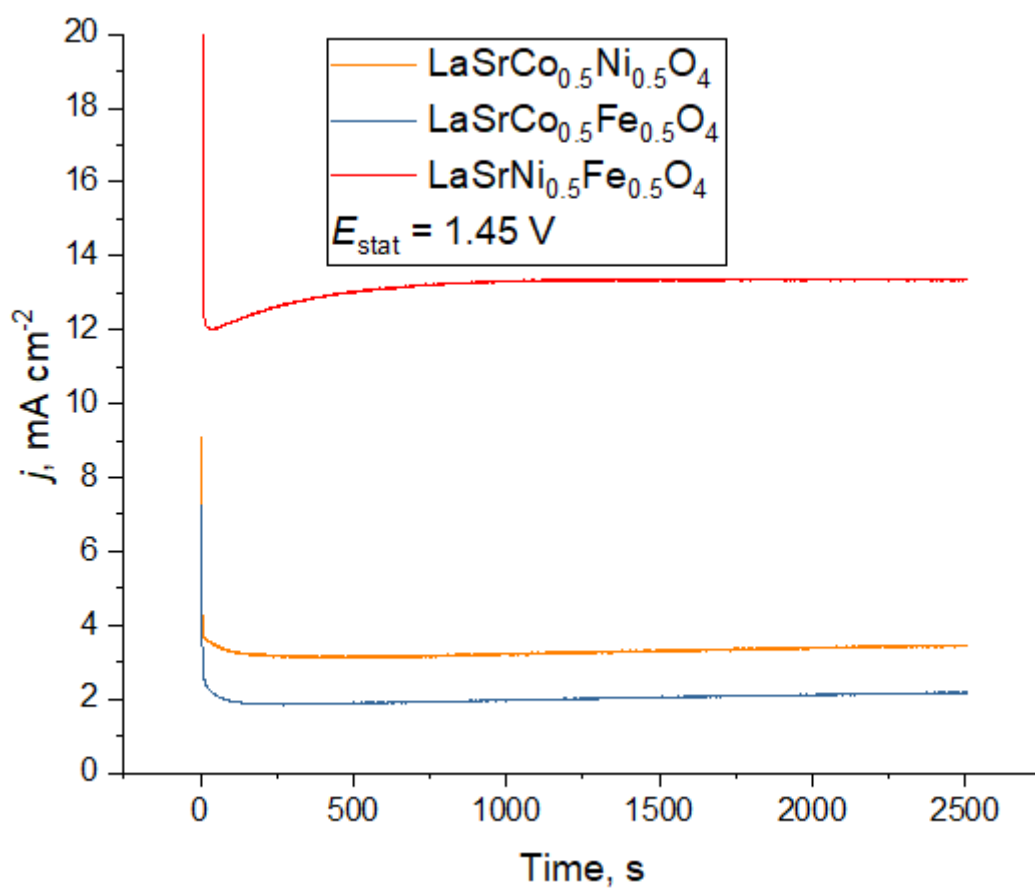


Figure S2. Chronoamperometry of samples obtained via USP method in OER.

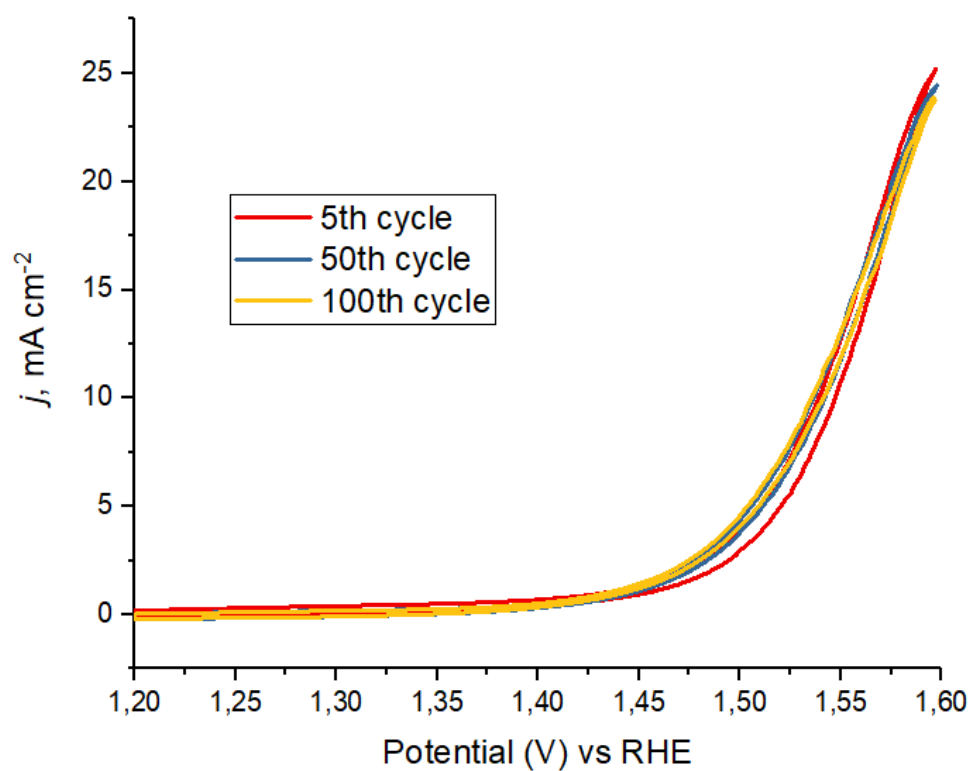


Figure S3. Stability tests of LSCF sample during 100 cycles in range of potentials from 1.2 to 1.58 V vs RHE at scan rate 20 mV s^{-1} .

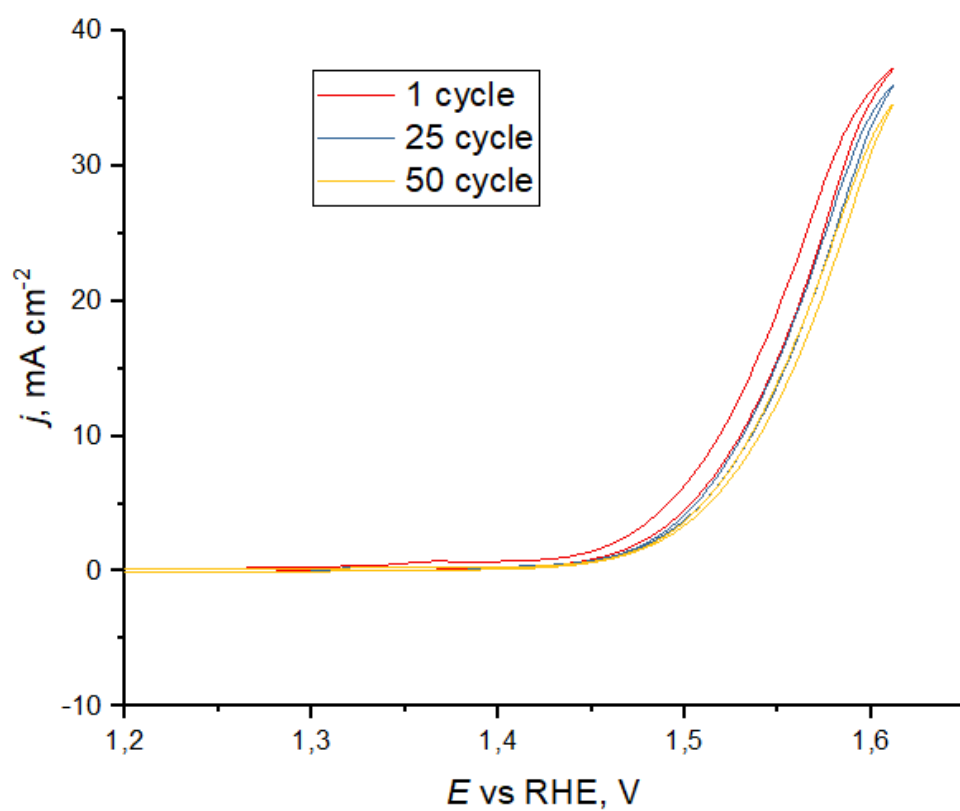


Figure S4. Stability tests of LSCN sample during 50 cycles in range of potentials from 1.2 to 1.6 V vs RHE at scan rate 10 mV s^{-1} .

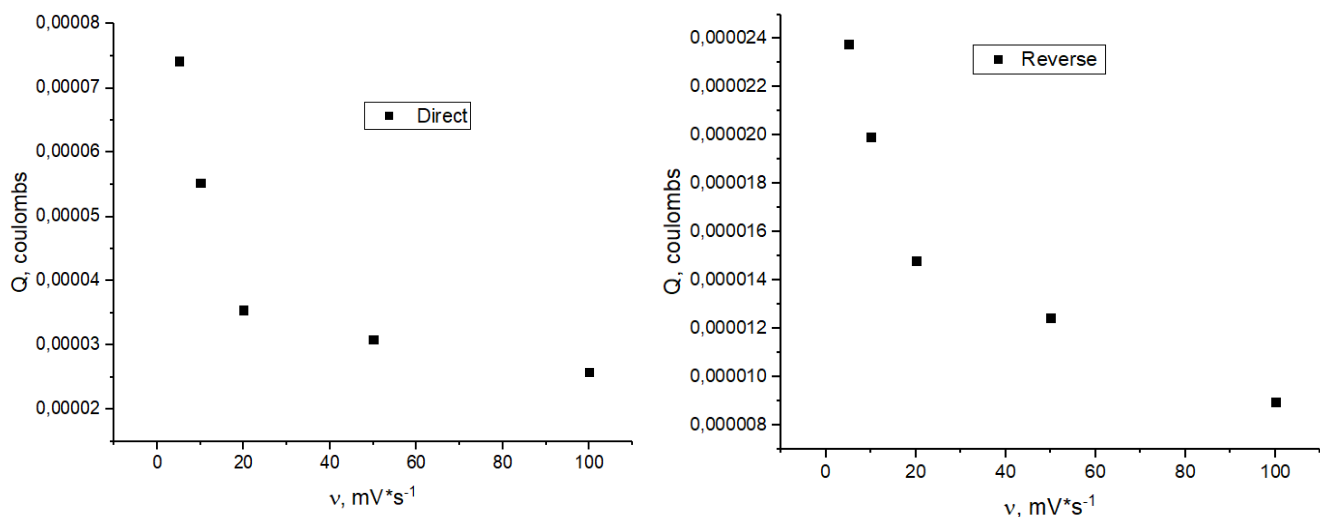


Figure S5. Dependence of anodic and cathodic charge for Ni redox from scan rate (5 – 100 mV s⁻¹) in LSNF sample.

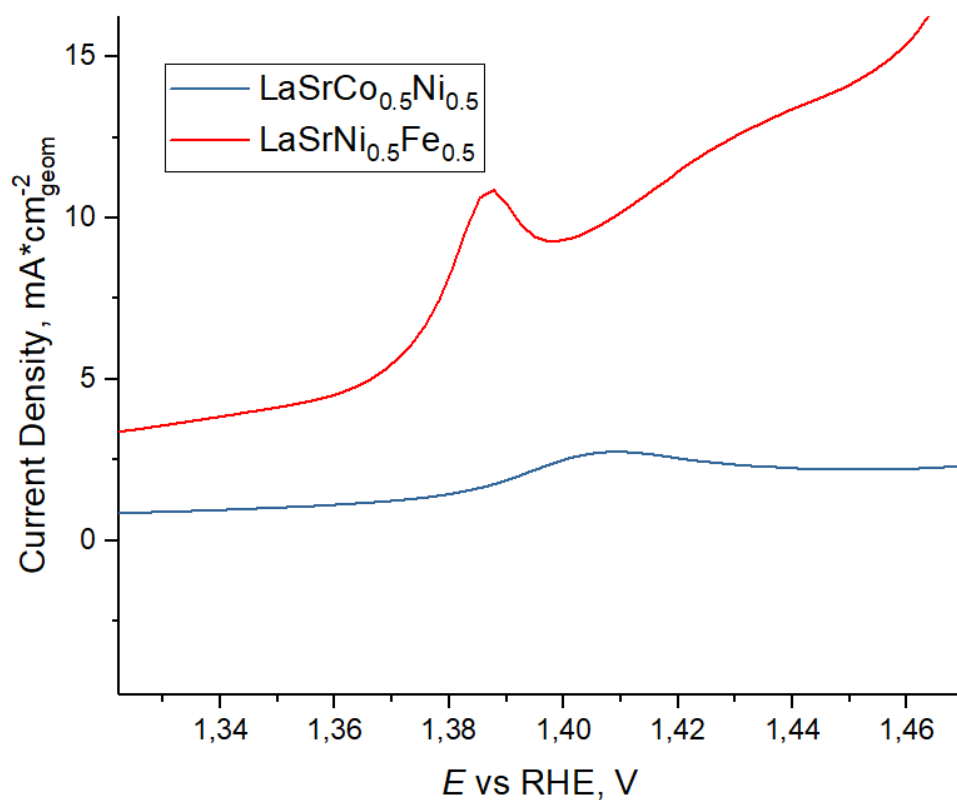


Figure S6. Oxidation peak of Ni²⁺/Ni³⁺ at anodic cyclic voltammetry curve (2nd cycle) for LSNF and LSCN.